Research Funded by the National Institutes of Health on the Health of Lesbian, Gay, Bisexual, and Transgender Populations

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Objectives. We examined the proportion of studies funded by the National Institutes of Health (NIH) that focused on lesbian, gay, bisexual, and transgender (LGBT) populations, along with investigated health topics.

Methods. We used the NIH RePORTER system to search for LGBT-related terms in NIH-funded research from 1989 through 2011. We coded abstracts for LGBT inclusion, subpopulations studied, health foci, and whether studies involved interventions.

Results. NIH funded 628 studies concerning LGBT health. Excluding projects about HIV/AIDS and other sexual health matters, only 0.1% (n = 113) of all NIH-funded studies concerned LGBT health. Among the LGBT-related projects, 86.1% studied sexual minority men, 13.5% studied sexual minority women, and 6.8% studied transgender populations. Overall, 79.1% of LGBT-related projects focused on HIV/AIDS and substantially fewer on illicit drug use (30.9%), mental health (23.2%), other sexual health matters (16.4%), and alcohol use (12.9%). Only 202 studies examined LGBT health–related interventions. Over time, the number of LGBT-related projects per year increased.

Conclusions. The lack of NIH-funded research about LGBT health contributes to the perpetuation of health inequities. Here we recommend ways for NIH to stimulate LGBT-related research. (*Am J Public Health.* 2014;104:e105–e112. doi: 10.2105/AJPH.2013.301501)

In 2010, the National Institutes of Health (NIH) commissioned the Institute of Medicine (IOM) to systematically examine the state of lesbian, gay, bisexual, and transgender (LGBT) health.[1] The IOM's report on the health of LGBT populations contributed to advancing the field of LGBT health by identifying research gaps and developing an agenda to guide NIH in enhancing its portfolio in this area.[1]

The findings highlighted in the IOM report are stark and reflect the inadequacy of LGBT health research to date. In general, LGBT populations experience stigma associated with their sexual and gender minority status, disproportionate behavioral risks and psychosocial health problems, and higher chronic disease risk factors than their heterosexual and cisgender counterparts.[1–3] (Cisgender refers to congruence between the gender category assigned to an individual at birth and the gender identity experienced by that individual.[4]) The greatest focus of LGBT health research to date is on the increased risk and incidence of HIV/AIDS and other sexually transmitted infections among sexual minority men.[1,5–8] Research on the health of sexual minority women and transgender populations is limited.[1] We know that LGBT people experience disproportionate mental health and substance use problems relative to their heterosexual and cisgender counterparts.[1,9–14] Inequities have also been documented in access to and utilization of health care among LGBT populations.[1,15–18] But research is lacking for many other pertinent LGBT health issues, including the effects of problematic access to care, homophobia, violence, homelessness, tobacco use, and obesity.[1]

NIH is the largest funder of medical research in the world,[19] but its contribution to the emerging body of knowledge on LGBT health was minimal from 1974 to 1992[20] and remains undocumented for more recent years. In response to the findings and recommendations in the IOM report, NIH in 2012 invited grant proposals for research on the health of lesbian, gay, bisexual, transgender, and intersex populations.[21–23] To accomplish the *Healthy People 2020* goal of health equity for LGBT populations,[2] public health researchers and practitioners need a large body of evidence for appropriate and effective means of improving health in these groups. However, the number of evidence-based interventions that succeed in improving the health and well-being of LGBT populations is unknown, and the extent to which they are being developed, implemented, and evaluated at NIH has yet to be illuminated. With NIH calling for new proposals, a comprehensive assessment of its funding of LGBT health research to date is necessary to ensure that funding is targeted to fill existing gaps in research.

Therefore, we aimed to understand the proportion and content areas of NIH-funded research from 1989 through 2011 that focused on the health and well-being of LGBT populations. We analyzed the overall proportions of NIH-funded studies that examined the health of LGBT populations, and we recorded the subpopulations included in these projects (e.g., sexual minority women, sexual minority men, transgender persons). We examined the content areas of LGBT health–related research for the LGBT population as a whole and by subpopulations. We also analyzed the health foci of LGBT health–related research after excluding studies about HIV/AIDS and other sexual health matters for the LGBT population as a whole and by subpopulations. We examined projects funded to develop, implement, and evaluate public health interventions that address the unique needs of the LGBT population as a whole and by subpopulations. Finally, we examined LGBT health–related projects funded by NIH over time.

METHODS

The NIH Research Portfolio Online Reporting Tools Expenditures and Results (RePORTER) system contains abstracts for funded studies dating back to 1989.[24] We used this tool to collect abstract data for 4 award types: research project grants, research career awards, fellowships, and training grants. The projects had a start date between January 1, 1989, and December 31, 2011. To ascertain the total number of unique studies funded by NIH, we restricted the search to project numbers ending in -01 and new award types, which yielded 127 798 unique studies.

To find studies that involved LGBT populations, we conducted an advanced text search with multiple forms of the following keywords: bisexual, gay, gender minority, gender variant, heterosexual, homophobia, homosexual, lesbian, men who have sex with men, sexual identity, sexual minority, sexual orientation, transgender, transsexual, and women who have sex with women. This search provided a sample of 1024 unique studies potentially related to LGBT health.

Data Coding

We systematically examined each abstract to discover whether it was, in fact, LGBT health related. We classified a study as LGBT health related if its abstract explicitly mentioned that it focused on the health of at least 1 LGBT subpopulation or if it stated that outcomes were examined by sexual orientation. We excluded projects without an LGBT health–related focus from subsequent coding and analyses. We also classified each abstract by the specific LGBT subpopulation(s) it explicitly mentioned.

We then conducted a directed content analysis to classify the primary health foci for each study, guided by topics outlined in the *Journal's* Editorial Manager under the "Areas of Interest or Expertise" section.[25,26] We modified this guide by assigning exact definitions for each code, eliminating codes that were too broad (e.g., social science, epidemiology, prevention), and adding codes for pertinent areas of LGBT health research (e.g., research infrastructure, homophobia, measurement validation, testing of sampling techniques). We listed multiple topic areas for each study that examined multiple health foci.

We collected additional data on the studies during the coding process. We coded projects that explicitly included people younger than 18 years, people aged 50 years and older, and populations outside the United States. We also included codes for projects that studied specific racial or ethnic groups and those that stated outcomes were examined by race or ethnicity.

Finally, we noted whether each project involved designing, implementing, or evaluating an intervention. This included behavioral and biomedical interventions, as well as the development of screening instruments, but excluded studies whose aim was to inform future intervention projects.

R. W. S. C. coded all studies, and K. S. K. coded a random 4.4% of the 1024 unique studies to assess interrater reliability. The 2 of us agreed on 94.2% of all codes in this reliability sample; we discussed disagreements until we reached consensus.

Data Analysis

We generated descriptive statistics on the proportion of NIH-funded projects that involved LGBT populations and on other characteristics of the project sample (Table 1). To examine the health content areas of the LGBT health–related studies, we looked at the topics by the LGBT population overall and by subpopulations, such as sexual minority women, sexual minority men, and transgender populations (Table 2). Next, we examined health content areas by the LGBT population overall and by subpopulations, after excluding studies related to HIV/AIDS and other sexual health matters (Table 2).

We then examined the content areas of public health interventions that involved LGBT populations by the LGBT population overall and by subpopulations (Table 3). Finally, we examined historical changes in the number and proportions of NIH-funded studies involving LGBT populations (Figure 1). We performed all analyses in SAS *Enterprise Guide* 5.4.[27]

RESULTS

Over the 23-year period, and excluding studies of HIV/AIDS and other sexual health matters, only 0.1% (n = 113) of all NIH-funded projects were LGBT health related (Table 1). Even with studies of HIV/AIDS and other sexual health matters included, just 0.5% (n = 628) of all NIH-funded studies related to LGBT health. We found 202 studies (0.2%) in the NIH portfolio that involved developing, implementing, or evaluating LGBT-related public health interventions. Only 21 studies supported LGBT health–related interventions without an explicit focus on HIV/AIDS or other sexual health matters.

Subpopulations

Of 628 NIH-funded LGBT health–related studies, 541 (86.1%) concerned the health of sexual minority men, 85 (13.5%) focused on sexual minority women, and 43 (6.8%) focused on transgender populations. Among LGBT subpopulations, men who have sex with men were the most studied: 49.4% of projects focused on their health. A smaller proportion of studies involved bisexual men and women (14.8% and 6.5%, respectively) than their gay and lesbian counterparts (36.9% and 10.0%, respectively).

A total of 43 studies examined the health of transgender populations. Twelve projects explicitly examined transgender women; 1 examined transgender men; and 3 examined two-spirit people (indigenous North Americans of mixed gender).

A total of 61 (9.7%) of the LGBT health–related studies explicitly included youths younger than 18 years, and just 0.3% explicitly examined adults aged 50 years and older. In addition, 31.4% of the abstracts mentioned the examination of race/ethnicity. A total of 12.1% of the studies involved populations outside the United States.

Health Content Areas

All studies that examined the health of LGBT populations. Of the 628 LGBT health–related studies, 497 (79.1%) focused on HIV/AIDS (Table 2). Substantially smaller proportions of the projects focused on illicit drug use (30.9%), mental health (23.2%), other sexual health matters (16.4%), and alcohol use (12.9%). Health care services, homophobia, violence, homelessness, tobacco use, and obesity were each addressed in fewer than 25 studies.

The distribution of health foci for studies of sexual minority men and transgender

TABLE 1—Studies Funded by the National Institutes of Health That Examined the Health of Lesbian, Gay, Bisexual, and Transgender Populations, by Subpopulation: 1989–2011

Content Area/Subpopulation	All NIH-Funded Studies (n = 127 798), %	All NIH-Funded LGBT Health-Related Studies (n = 628), %
LGBT health-related studies (n = 628)	0.5	100.0
Including those focusing on HIV/AIDS or other sexual health matters (n = 515)	0.4	82.0
Excluding those focusing on HIV/AIDS or other sexual health matters (n = 113)	0.1	18.0
LGBT health-related intervention studies (n = 202)	0.2	32.2
Including those focusing on HIV/AIDS or other sexual health matters (n = 181)	0.1	28.8
Excluding those focusing on HIV/AIDS or other sexual health matters (n = 21)	< 0.1	3.3
Studies involving sexual minority women		
Total (n = 85)		13.5
Involving lesbians (n = 63)		10.0
Involving bisexual women (n = 41)		6.5
Involving women who have sex with women (n = 3)		0.5
Studies involving sexual minority men		
Total studies (n = 541)		86.1
Involving gay men (n = 232)		36.9
Involving bisexual men (n = 93)		14.8
Involving men who have sex with men (n = 310)		49.4
Involving men who have sex with both men and women (n = 16)		2.5
Studies involving transgender persons		
Total (n = 43)		6.8
Involving transgender women (n = 12)		1.9
Involving transgender men (n = 1)		0.2
Involving two-spirit persons (n = 3)		0.5
Studies involving persons aged < 18 y (n = 61)		9.7
Studies involving persons aged ≥ 50 y (n = 2)		0.3
Studies examining race/ethnicity (n = 197)		31.4
Studies involving populations outside United States (n = 76)		12.1

Note. LGBT = lesbian, gay, bisexual, and transgender; NIH = National Institutes of Health. Some studies involved ≥ 1 subpopulation, so numbers may sum to > 628 and > 100%.

populations was similar to the distribution of topics among the total sample. For example, HIV/AIDS was the most examined topic, followed by illicit drug use and mental health. HIV/AIDS was the focus of 83.4% of projects involving sexual minority men and 65.1% of projects involving transgender populations. Among studies that targeted sexual minority women, 47.1% focused on mental health, 30.6% on alcohol use, and 28.2% on illicit drug use.

Studies that did not focus on HIV/AIDS and other sexual health matters. After excluding studies focused on HIV/AIDS and other sexual health matters, we still found more involving sexual minority men (n = 79) than sexual minority women (n = 62) and substantially fewer involving transgender populations (n = 14). Overall, 40.7% of these projects focused on mental health, 24.8% on illicit drug use, and 23.9% on alcohol use.

Interventions

Of the 202 LGBT health–related projects that developed, implemented, or evaluated interventions, 176 (87.1%) focused on HIV/AIDS (Table 3). In addition, 30.7% of interventions focused on illicit drug use, 18.8% on other sexual health, 18.3% on mental health, and 12.9% on alcohol use. Substantially fewer interventions concerned other health-related inequities experienced by LGBT populations, such as homophobia, violence, homelessness, tobacco use, and obesity.

Nearly all the interventions focused on sexual minority men (n = 182), and more interventions involved transgender populations (n = 15) than sexual minority women (n = 12). Among sexual minority men and transgender populations, interventions focusing on HIV/AIDS were the most common (89.6% and 60.0%, respectively).

Historical Changes

Figure 1a shows an overall increase in LGBT health–related studies from 1989 to 2011. NIH funded fewer than 25 such studies each year from 1989 to 1999. From 2000 to 2003 more than 30 studies received funding each year, but the number rapidly decreased, to 24 in 2004 and 14 in 2005. Funded studies increased substantially from 2005 to 2011, when they reached an all-time high of 65. The trend in total number of LGBT health–related

TABLE 2—Studies Funded by the National Institutes of Health That Examined the Health of Lesbian, Gay, Bisexual, and Transgender Populations, by Content Area: 1989–2011

	Total LGBT Health-Related Studies, Including Studies About HIV/AIDS and Other Sexual Health Issues				LGBT Health-Related Studies, Excluding Studies About HIV/AIDS and Other Sexual Health Issues			
Content Area	Total Studies (n = 628), No. (%)	Studies Involving Sexual Minority Women (n = 85), No. (%)	Studies Involving Sexual Minority Men (n = 541), No. (%)	Studies Involving Transgender Persons (n = 43), No. (%)	Total Studies (n = 113), No. (%)	Studies Involving Sexual Minority Women (n = 62), No. (%)	Studies Involving Sexual Minority Men (n = 79), No. (%)	Studies Involving Transgender Persons (n = 14), No. (%)
HIV/AIDS	497 (79.1)	16 (18.8)	451 (83.4)	28 (65.1)				
Illicit drug use	194 (30.9)	24 (28.2)	173 (32.0)	13 (30.2)	28 (24.8)	15 (24.2)	21 (26.6)	5 (35.7)
Mental health	146 (23.2)	40 (47.1)	124 (22.9)	10 (23.3)	46 (40.7)	33 (53.2)	36 (45.6)	6 (42.9)
Other sexual health, including STIs and excluding HIV/AIDS	103 (16.4)	9 (10.6)	85 (15.7)	5 (11.6)				
Alcohol use	81 (12.9)	26 (30.6)	68 (12.6)	6 (14.0)	27 (23.9)	20 (32.3)	18 (22.8)	3 (21.4)
Genetics	39 (6.2)	1 (1.2)	33 (6.1)	0 (0.0)	9 (8.0)	1 (1.6)	4 (5.1)	0 (0.0)
Cancer	35 (5.6)	5 (5.9)	29 (5.4)	1 (2.3)	13 (11.5)	5 (8.1)	8 (10.1)	1 (7.1)
Couples and family health	29 (4.6)	8 (9.4)	24 (4.4)	3 (7.0)	9 (8.0)	8 (12.9)	7 (8.9)	0 (0.0)
Health care services	21 (3.3)	5 (5.9)	15 (2.8)	8 (18.6)	5 (4.4)	4 (6.5)	3 (3.8)	4 (28.6)
Violence	21 (3.3)	9 (10.6)	15 (2.8)	1 (2.3)	10 (8.8)	8 (12.9)	6 (7.6)	1 (7.1)
Homophobia	19 (3.0)	1 (1.2)	16 (3.0)	0 (0.0)	2 (1.8)	1 (1.6)	1 (1.3)	0 (0.0)
Hepatitis	18 (2.9)	0 (0.0)	15 (2.8)	2 (4.7)	1 (0.9)	0 (0.0)	1 (1.3)	0 (0.0)
Vaccines or immunizations	17 (2.7)	1 (1.2)	17 (3.1)	1 (2.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Infrastructure for researchers of LGBT health	13 (2.1)	3 (3.5)	9 (1.7)	3 (7.0)	8 (7.1)	3 (4.8)	5 (6.3)	3 (21.4)
Screening	12 (1.9)	3 (3.5)	8 (1.5)	1 (2.3)	7 (6.2)	3 (4.8)	4 (5.1)	1 (7.1)
Measurement validation or testing of sampling methods	10 (1.6)	2 (2.4)	8 (1.5)	0 (0.0)	4 (3.5)	2 (3.2)	2 (2.5)	0 (0.0)
Tobacco	9 (1.4)	7 (8.2)	8 (1.5)	3 (7.0)	8 (7.1)	7 (11.3)	7 (8.9)	3 (21.4)
Homelessness	8 (1.3)	1 (1.2)	5 (0.9)	2 (4.7)	2 (1.8)	0 (0.0)	2 (2.5)	0 (0.0)
Cost-effectiveness and other health financing	7 (1.1)	1 (1.2)	6 (1.1)	0 (0.0)	1 (0.9)	1 (1.6)	0 (0.0)	0 (0.0)
Health policy	6 (1.0)	2 (2.4)	6 (1.1)	0 (0.0)	4 (3.5)	2 (3.2)	4 (5.1)	0 (0.0)
Obesity or overweight	6 (1.0)	4 (4.7)	3 (0.6)	1 (2.3)	6 (5.3)	4 (6.5)	3 (3.8)	1 (7.1)
Cardiovascular disease	5 (0.8)	2 (2.4)	3 (0.6)	0 (0.0)	3 (2.7)	2 (3.2)	1 (1.3)	0 (0.0)
Immigration	4 (0.6)	1 (1.2)	3 (0.6)	0 (0.0)	1 (0.9)	1 (1.6)	1 (1.3)	0 (0.0)
Ethical issues	3 (0.5)	0 (0.0)	2 (0.4)	0 (0.0)	2 (1.8)	0 (0.0)	1 (1.3)	0 (0.0)
Dental/oral health	2 (0.3)	0 (0.0)	2 (0.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Diabetes	2 (0.3)	0 (0.0)	1 (0.2)	1 (2.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Environment health	2 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)	2 (1.8)	0 (0.0)	0 (0.0)	0 (0.0)
Nutrition, food, and dietary habits	2 (0.3)	2 (2.4)	2 (0.4)	0 (0.0)	2 (1.8)	2 (3.2)	2 (2.5)	0 (0.0)
Exercise/physical activity	1 (0.2)	1 (1.2)	1 (0.2)	0 (0.0)	1 (0.9)	1 (1.6)	1 (1.3)	0 (0.0)
Maternal and infant health	1 (0.2)	1 (1.2)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Tuberculosis	1 (0.2)	0 (0.0)	1 (0.2)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Note. LGBT = lesbian, gay, bisexual, and transgender; STI = sexually transmitted infection. Some studies involved ≥ 1 subpopulation or content area, so numbers may sum to > 628 or 113 and > 100%.

TABLE 3—Intervention Studies Funded by the National Institutes of Health That Examined the Health of Lesbian, Gay, Bisexual, and Transgender Populations, by Content Area: 1989–2011

Content Area	Total Studies (n = 202), No. (%)	Studies Involving Sexual Minority Women (n = 12), No. (%)	Studies Involving Sexual Minority Men (n = 182), No. (%)	Studies Involving Transgender People (n = 15), No. (%)
HIV/AIDS	176 (87.1)	3 (25.0)	163 (89.6)	9 (60.0)
Illicit drug use	62 (30.7)	5 (41.7)	58 (31.9)	4 (26.7)
Mental health	37 (18.3)	4 (33.3)	32 (17.6)	3 (20.0)
Other sexual health, including STIs and excluding HIV/AIDS	38 (18.8)	2 (16.7)	32 (17.6)	2 (13.3)
Alcohol use	26 (12.9)	5 (41.7)	24 (13.2)	3 (20.0)
Genetics	1 (0.5)	0 (0.0)	1 (0.5)	0 (0.0)
Cancer	7 (3.5)	1 (8.3)	4 (2.2)	1 (6.7)
Couples and family health	7 (3.5)	0 (0.0)	6 (3.3)	1 (6.7)
Health care services	12 (5.9)	3 (25.0)	9 (4.9)	4 (26.7)
Violence	5 (2.5)	1 (8.3)	4 (2.2)	0 (0.0)
Homophobia	3 (1.5)	0 (0.0)	3 (1.6)	0 (0.0)
Hepatitis	4 (2.0)	0 (0.0)	4 (2.2)	0 (0.0)
Vaccines or immunizations	10 (5.0)	1 (8.3)	10 (5.5)	1 (6.7)
Infrastructure for researchers of LGBT health	1 (0.5)	0 (0.0)	0 (0.0)	0 (0.0)
Screening	4 (2.0)	1 (8.3)	4 (2.2)	1 (6.7)
Measurement validation or testing of sampling methods	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Tobacco	2 (1.0)	2 (16.7)	2 (1.1)	2 (13.3)
Homelessness	2 (1.0)	0 (0.0)	2 (1.1)	0 (0.0)
Cost-effectiveness and other health financing	2 (1.0)	0 (0.0)	2 (1.1)	0 (0.0)
Health policy	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Obesity or overweight	2 (1.0)	1 (8.3)	0 (0.0)	0 (0.0)
Cardiovascular disease	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Immigration	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Ethical issues	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dental/oral health	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Diabetes	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Environment health	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nutrition, food, and dietary habits	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Exercise/physical activity	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Maternal and infant health	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Tuberculosis	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Note. LGBT = lesbian, gay, bisexual, and transgender; STI = sexually transmitted infection. Some studies involved ≥ 1 subpopulation or content area, so numbers may sum to > 202 and > 100%.

studies (Figure 1a) was similar to the trend in the percentage of all NIH-funded studies that focused on LGBT health (Figure 1b). However, increases in the percentage of NIH-funded LGBT projects without an explicit focus on HIV/AIDS or sexual health were small.

Figure 1a also shows historical data on NIH-funded studies by subpopulation and intervention studies. Studies involving sexual minority men followed a trajectory nearly identical in shape and magnitude to total LGBT health–related studies. On the other hand, almost no projects focused on sexual minority women and transgender populations from 1989 through 1996. The number of studies related to these subpopulations grew slightly from 1997 through 2011, but remained consistently under 13 per year. The number of intervention studies from 1989 to 1995 was low, but higher than the number of studies involving sexual minority women and transgender populations. Intervention studies increased slightly from 1996 through 2009 and dramatically in 2010 and 2011.

DISCUSSION

The IOM report documented many gaps in LGBT health disparities research.[1] Our analysis was the first to our knowledge to use the RePORTER system to quantify the level of NIH extramurally funded LGBT health research. Our primary finding, that only 0.1% of NIH-funded studies were related to LGBT populations (after excluding those with an explicit focus on HIV/AIDS or other sexual health issues), confirmed the dearth of research

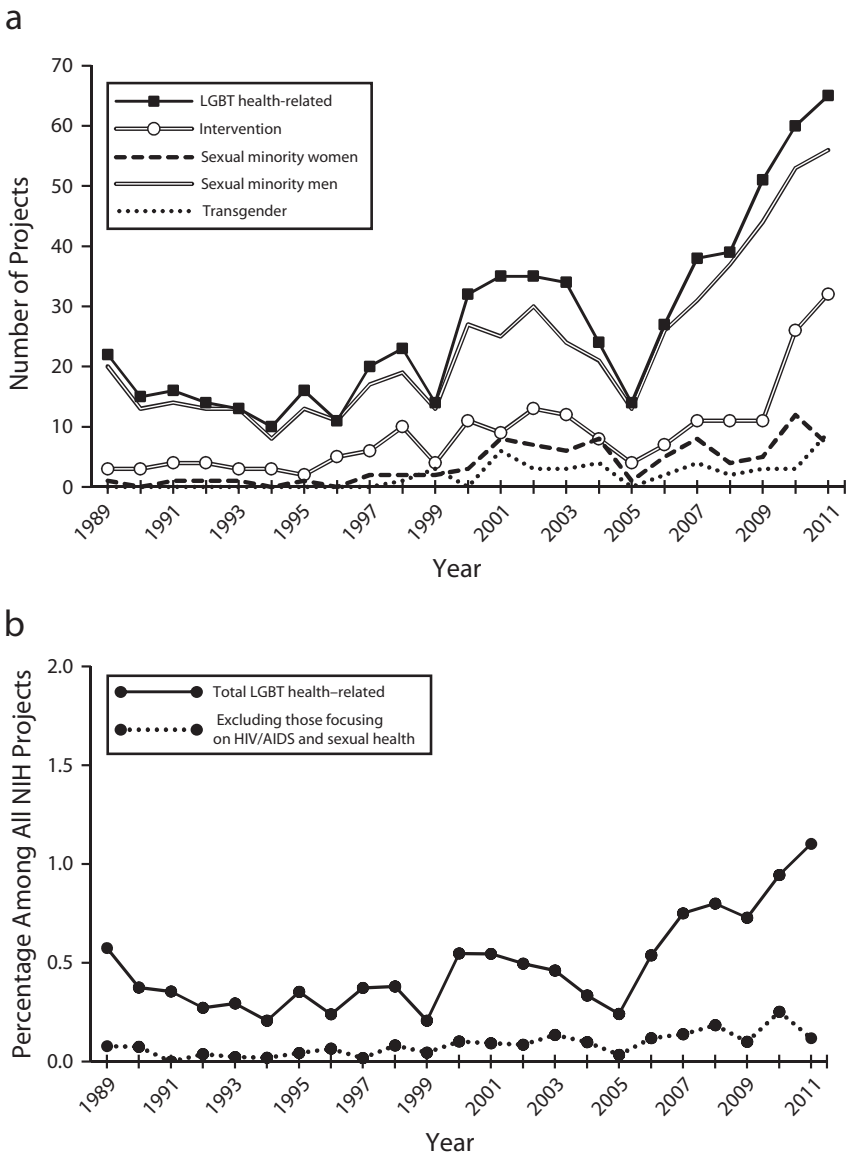

FIGURE 1—Studies funded by the National Institutes of Health (NIH) that examined the health of lesbian, gay, bisexual, and transgender (LGBT) populations, by year and by (a) frequency and (b) percentage: 1989–2011.

thus far. An increase in the percentage of LGBT health–related projects over time was primarily attributable to HIV/AIDS studies. Despite research efforts, sexual minority men continue to be disproportionately affected by this disease.[1] The percentage of funded studies without an explicit focus on HIV/AIDS or sexual health increased only slightly during the 23-year period. As the world's largest source of health research funding,[19] NIH has placed a low priority on LGBT health research, which contributes to the perpetuation of LGBT health inequities.

Moreover, the LGBT health research portfolio at NIH was inequitably distributed among LGBT subpopulations over the 23-year study period. The vast majority of research focused on sexual minority men, with substantially fewer studies on sexual minority women. Even less NIH funding was allocated to research on transgender health, furthering a general trend of insufficient funding to support empirical research related to this population. Furthermore, our analysis revealed that inequities in funded research on LGBT subpopulations held true even after studies focused on HIV/AIDS and other sexual health matters were excluded. Although we saw modest growth in research involving sexual minority men over time, increases in studies of sexual minority women and transgender populations were inadequate. These research gaps inhibit the reduction of health disparities between LGBT populations and heterosexual and cisgender populations.

Our analysis also highlighted the lack of NIH research pertaining to certain age groups and to LGBT populations of color. Very few studies explicitly examined the health of LGBT people younger than 18 years or 50 years and older, indicating a lack of research funding to examine LGBT health issues among populations in the most vulnerable stages of the life course. Moreover, 68.6% of abstracts failed to mention race or ethnicity, a notable omission because LGBT people of color may face disproportionate health inequities that arise when race/ethnicity, sexual orientation, and gender identity intersect.[1] These intersections merit further research.

In addition, many health issues of concern for LGBT populations were underrepresented in the NIH portfolio. As noted in previous reviews, little NIH-funded research has focused on specific LGBT health concerns other than HIV/AIDS.[20,28] We found that this gap continued in recent NIH-funded research. Illicit drug use, mental health, and alcohol use followed HIV/AIDS as the most frequently funded research topics. Moreover, we found substantial gaps in many other important areas, such as tobacco use, cancer, obesity, and topical areas historically affecting LGBT well-being, such as violence, homophobia, and access to and quality of health care services. The paucity of research in these areas further constricts opportunities to advance health equity for LGBT populations.

It has been documented that political environments have contributed to a chilling effect within NIH that constrains LGBT health research.[29–31] This ethos was solidified in 2003 when a senator proposed an amendment to the NIH appropriations bill to rescind the funding of 5 research studies that concerned LGBT populations.[29–31] Although this

amendment failed to pass, a group of Republican Congress members asked NIH to justify the benefits of research for an expanded list of nearly 200 projects, most of which investigated LGBT or other marginalized populations, such as sex workers.[29–31] One study documented that 51% of researchers whose projects were targeted by the expanded inquiry began removing words perceived as controversial (e.g., gay, lesbian, bisexual, and even AIDS) from proposal titles and abstracts.[29] Some of this censorship followed advice from NIH project officers.[29] Furthermore, 25% of the researchers reported that the controversy made them more likely to seek funding outside of NIH, a smaller proportion completely dropped their LGBT-related studies, and some even changed careers.[29] These studies show how political landscapes have institutionalized LGBT discrimination and influenced scientific research. Correspondingly, we observed a decrease in LGBT health–related projects from 2003 to 2005, suggesting that the political environment may be responsible, in part, for the marginalization of LGBT health research at NIH.

Our findings can guide NIH and other funding agencies in advancing the public health core value of social justice[32] by funding projects related to LGBT health. NIH has taken steps to address some of these issues by creating a Research Coordinating Committee responsible for facilitating collaboration across the agency, supporting a 2012 workshop about sexual orientation and gender identity in electronic health records, and encouraging professional development activities related to LGBT health.[33] We present the following additional recommendations for consideration:

1. Policies that publicly designate LGBT people as priority populations for research are warranted, and priority should be given to enhancing research on understudied LGBT subpopulations and health foci. Research that focuses on subpopulations will assist in illuminating differences between groups that have thus far been obscured by aggregating LGBT populations into a monolithic category. Furthermore, health issues in addition to HIV/AIDS and sexual health disproportionately experienced by LGBT populations should receive priority in funding.
2. Intervention research on LGBT health–related topics is a key area in need of additional funding if NIH is to support effective, evidence-based solutions that reduce health inequities. A research agenda that emphasizes advancing knowledge, improving data collection practices, and encouraging research on health inequities for the diversity of LGBT populations is necessary to achieve this goal.
3. New strategies need to be explored to increase the amount of LGBT health research generated by NIH. The release of the recent funding opportunity will spur some of the research that is called for in the IOM report. This call for proposals, however, is a renewal of a past funding announcement and does not constitute an increase in NIH activity from previous years. In 2011, investigators published a study in *Science* showing that the chances of receiving an NIH extramural research award varied by the race and ethnicity of the applicant.[34] Black researchers in particular had a substantially lower chance of receiving an award.[34] This spurred internal reflection at NIH on mechanisms to support diversity among researchers. Considering the effect of the previous climate on LGBT career development, funding mechanisms and other actions aimed at addressing minority health inequities should be expanded in scope and funding to include eligibility for LGBT researchers.
4. NIH should explore strategies for expanding the pool of trained researchers who are prepared to propose viable extramural LGBT research projects. Additional analyses (data not shown) revealed only slight increases in training grants (n = 5), fellowships (n = 36), and career awards (n = 40) over time. Although career awards increased the most over time, at most 2 career awards per year were funded in 16 out of the 23 years we examined. One mechanism NIH previously used to spur research in a new program area was the establishment of centers of excellence in a discipline. These centers of excellence bring together scientists to spur collaboration and provide active mentoring to a new cadre of incoming researchers. This strategy could create a larger base of researchers who are prepared to propose LGBT research projects to NIH.

Our study was illustrative, but it had limitations. Research abstracts available in NIH's RePORTER system have not always included LGBT health–related terms, even if researchers intended to examine these issues, as noted in a previous study.[29] Abstracts in the RePORTER system have not necessarily reflected the scope of work carried out by researchers, because project scopes sometimes change. Together, it is likely that these limitations caused an underestimate in the reported point estimates. In addition, unlike in the *Science* study,[34] we were not able to assess the sexual orientation or gender identity of the principal investigators. If these data were collected, they would shed additional light on the current climate at NIH. Despite these limitations, the RePORTER system is the most reliable and accessible tool available for an external review of NIH's funding of research on LGBT health.

The absence of a robust body of research on LGBT health limits knowledge about mechanisms for improving health and reducing inequities in these populations. Implementing policies at NIH that target the unique health needs of LGBT populations will create a more diversified and just research portfolio that helps illuminate the path toward health equity. ■

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R. W. S. Coulter designed the study, conducted analyses, and led the interpretation and writing. All authors contributed to analyses, interpretation, and writing and approved the final article. Scout originated the study.

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